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BOSTON SOCIETY OF CIVIL ENGINEERS
FOUNDED 1848

PROCEEDINGS

PAPERS IN THIS NUMBER.

"In Memory of Samuel Everett Tinkham."

His life as a young man. E. W. Howe.

His connection with the Boston Society of Civil Engineers.
Desmond FitzGerald.

His services as an engineer. F. H. Fay.

A brother Mason's tribute. J. K. Berry.

MINUTES OF MEETING.

BOSTON, September 21, 1921. — The regular meeting of the Society was held this evening in Chipman Hall, Tremont Temple, and was called to order at 8.00 o'clock P.M. by the President, Robert Spurr Weston.

There were 33 members and guests present.

The minutes of the meeting of June 15 were read and approved.

The President announced that the Board of Government had elected the following to membership in the grades named:

Members — Messrs. Robert W. Kent, Harold F. Marnell, Thomas Mulcare and Reeves J. Newsom.

Junior — Mr. Viviano L. Valdes.

The President announced the deaths of the following: Richard Hutchison, who died June 15, 1921; Roy C. Aiken, who died June 24, 1921; W. Herbert Bacon, who died August 27, 1921; and it was voted that the President be authorized to appoint committees to prepare memoirs of the deceased members.

The President presented the report of the Tinkham Memorial Committee, and stated that it had been approved by the Board of Government and that he had been instructed to inform the Society that it was the opinion of the Board that the fund be increased to six thousand dollars, so that a full scholarship could be provided. It was voted to accept the report of the Tinkham Memorial Committee and to endorse the action of the Board of Government thereon.

The Committee on the Tinkham Memorial presented a photograph of the late Secretary, S. Everett Tinkham, which was accepted by the President.

The speakers of the evening were then introduced, the first speaker being Past President Edward W. Howe, who read a paper on Mr. Tinkham's personal life. J. K. Berry, Esq., was then called upon to speak on Mr. Tinkham's Masonic career. Past President Frederic H. Fay presented a paper on Mr. Tinkham's career as an engineer, and Past President Edward W. Howe read a paper prepared by Past President Desmond FitzGerald, on Mr. Tinkham's connection with the Boston Society of Civil Engineers.

After extending a vote of thanks to Mr. Berry, the meeting adjourned.

RICHARD K. HALE,
Acting Secretary.

REPORT OF THE COMMITTEE ON THE TINKHAM MEMORIAL.

AUGUST 23, 1921.

Mr. ROBERT SPURR WESTON,
Boston Society of Civil Engineers,
Tremont Temple, Boston, Mass.

Dear Sir, — The committee appointed to consider a memorial for Mr. S. E. Tinkham begs leave to report to the Board of Government, through the President, that it had considered various forms of memorial, and recommends to the Board, as the most suitable form, the creation of a fund for scholarship or fellowship in research work at the Massachusetts Institute of

Technology, to be known as the "S. E. Tinkham Memorial Fund."

The committee has also arranged for the unveiling of a suitable picture at the Memorial Meeting, to be held in September, at which various addresses are to be given regarding the various activities of his life.

Very truly yours,

(Signed) JOHN E. CARTY,
Secretary of the Committee.

APPLICATIONS FOR MEMBERSHIP.

[October 15, 1921.]

THE By-Laws provide that the Board of Government shall consider applications for membership with reference to the eligibility of each candidate for admission and shall determine the proper grade of membership to which he is entitled.

The Board must depend largely upon the members of the Society for the information which will enable it to arrive at a just conclusion. Every member is therefore urged to communicate promptly any facts in relation to the personal character or professional reputation and experience of the candidates which will assist the Board in its consideration. Communications relating to applicants are considered by the Board as strictly confidential.

The fact that applicants give the names of certain members as reference does not necessarily mean that such members endorse the candidate.

The Board of Government will not consider applications until the expiration of twenty (20) days from the date given.

HOLMGREN, RICHARD SIGFRID, Lynn, Mass. (Age 26, b. Worcester, Mass.) Attended Lynn English High School, and worked afternoons as rodman and instrumentman with local surveyor. From Aug., 1914, to Aug., 1915, worked as chainman and computer on valuation of the Bay State Street Railway. Graduated from Mass. Institute of Technology in 1920. From June, 1920, to Nov., same year, worked as transitman for H. K. Barrows, in Salem, N. H.; from Nov., 1920, to June, 1921, was assistant engineer with L. H. Shattuck, Inc., on sewer survey and study of sewerage system of Manchester, N. H.; June to Sept. 1 was draftsman and designer with the Holyoke Water Power Co.; Sept. 1 to the present, assistant engineer on the construction of a dam at Salem, N. H., for H. K. Barrows. Refers to H. K. Barrows, C. A. Moore, P. A. Shaw and G. G. Shedd.

LIST OF MEMBERS.

ADDITIONS.

MARNELL, HAROLD F.....	192 Quincy St., Dorchester 21, Mass.
NEWSOM, REEVES J.,	
Commissioner Water Supply, Lynn, Mass., 11 Hovey Terrace, Lynn, Mass.	
SHEA, JOSEPH T.....	14 Haskell St., Cambridge, Mass.

CHANGES OF ADDRESS.

BARRY, C. GARDNER.....	75 Gainsborough St., Suite 4, Boston
CHAPMAN, BENJAMIN R.....	City Hall, Everett, Mass.
DASHPER, FRED C.....	30 Leinster Sq., Bayswater, London, W. 2
FLETT, LOUIS E.....	154 Youle St., Melrose, Mass.
HASTIE, FRANK B.....	Camp A. A. Humphrey, Va.
HERING, RUDOLPH.....	40 Lloyd Road, Montclair, N. J.

DEATHS.

HABERSTROH, CHARLES E.....	September 25, 1921
MILLS, HIRAM FRANCIS.....	October 4, 1921

LIBRARY NOTES.

BOOK REVIEWS.

"HANDBOOK OF CONSTRUCTION EQUIPMENT," by Richard T. Dana, consulting engineer. First edition. New York, McGraw-Hill Book Company. Leather, 4½ x 7 in.; 1 vol., pp. 849, figures and tables.

REVIEWED BY J. ARTHUR GARROD.*

The handbook compiled by Mr. Dana is in compact form and clearly printed. It describes nearly all types of equipment generally used, and some which are only occasionally employed in construction work.

It treats not only of the newer and more complicated pieces of machinery, but compares the relative efficiency of such simple and familiar pieces of equipment as scrapers, hand shovels and wheelbarrows, when used under given conditions. It enters into some detail of such large pieces of equipment as dipper and clam-shell dredges.

* Superintendent Aberthaw Construction Co., 27 School St., Boston, Mass.

The arrangement of the book gives:

First, a statement of general principles and an explanation of ways recommended of using the information which follows.

Second, an alphabetical description of the pieces of equipment.

This arrangement appears to be more suitable than any other which could have been adopted, although the work, like the dictionary, becomes thereby "interesting, but rather disconnected."

The handbook is complete with charts, tables of costs and other data, which should be of considerable value to the engineer who has to suggest or pass upon methods of work and the necessary equipment, as well as the engineering contractor whose success or failure depends so largely upon the equipment and methods he employs.

There are frequent references to the authority for most of the articles in this compilation which should give those who have to give these matters more exhaustive study, a right start in investigating the special problems in question.

The prices quoted throughout are stated to be those of 1920. The changes in prices that have taken place since this time are considerable and not always consistent; still, the figures given should afford some guide even to-day as to what price may be expected and calculated upon when preliminary estimates are being made.

The section dealing with rental charges contains some suggestive data and methods for comparing the first cost with the rentals. This section appears to be rather scanty when the importance of the subject to the contractor and engineer is considered.

An appendix gives classified names of dealers and manufacturers of contractor's plant throughout these United States. A casual examination will show this to be far from complete. Those from whom used plant can be rented or purchased are omitted altogether.

The perusal of this book has proven helpful to the reviewer who is daily engaged in actual construction work. It should prove valuable to all engaged in a like business.

"LOCATION, GRADING AND DRAINAGE OF HIGHWAYS," by Wilson G. Harger, C. E. First edition. New York, McGraw-Hill Book Company. Cloth, 6 x 9 in.; 1 vol., pp. 294, figures, maps and tables.

REVIEWED BY DAVID A. AMBROSE.*

The importance of studying the highway program for a general scheme to meet the requirements and of "starting right" are emphasized in this book.

Chapter I presents the general principles of economic design, with mileage as the most important factor of service. The summary on page 27, which invites attention to the eleven important principles discussed, is excellent.

Chapter II takes up the important features of design, including selection of the best general route, selection of the most natural engineering location following the desired general route, and improvements for the future.

The general survey of the road problem in Chapter III contains classification, route, and the problem of financing road construction. The reader will find the discussion of grades and alignment in Chapter IV of great interest, and it brings out clearly the fact that grades and alignment are fundamental, permanent features of highway improvement.

Chapter V takes up the cross-sections of rural roads, widths of pavements, right of way and clearing, with many figures showing typical sections of roads in many states and of types recommended.

In the last chapter the problem of drainage includes types of bridges and culverts, surface drainage and underdrainage.

There are six chapters, covering 278 pages, in this volume.

This book is the first of a series of four volumes, and, as the author states, is intended for the use of students and practicing engineers. It is of distinctive value in its discussion of the permanent features of highway construction.

* First Asst. Engineer, Mass. Metropolitan Park Commission, 18 Tremont St., Boston, Mass.

RECENT ADDITIONS TO THE LIBRARY.

U. S. Government Reports.

Fourteenth Census of the United States. 1920.
Housing and Town Planning. Report. 1920.
Twenty-three Topographical Maps.
Water-Supply Papers, 459, 460, 475, 476.

State Reports.

Massachusetts. Annual report of Public Utilities. 1920.
New Jersey. Annual report, Department of Conservation and Development.

Municipal Reports.

Boston, Mass. Boston's Streets. 1919 and 1921.
New York, N. Y. Depreciation Charges of Railroads and Public Utilities. Carter and Ransom.

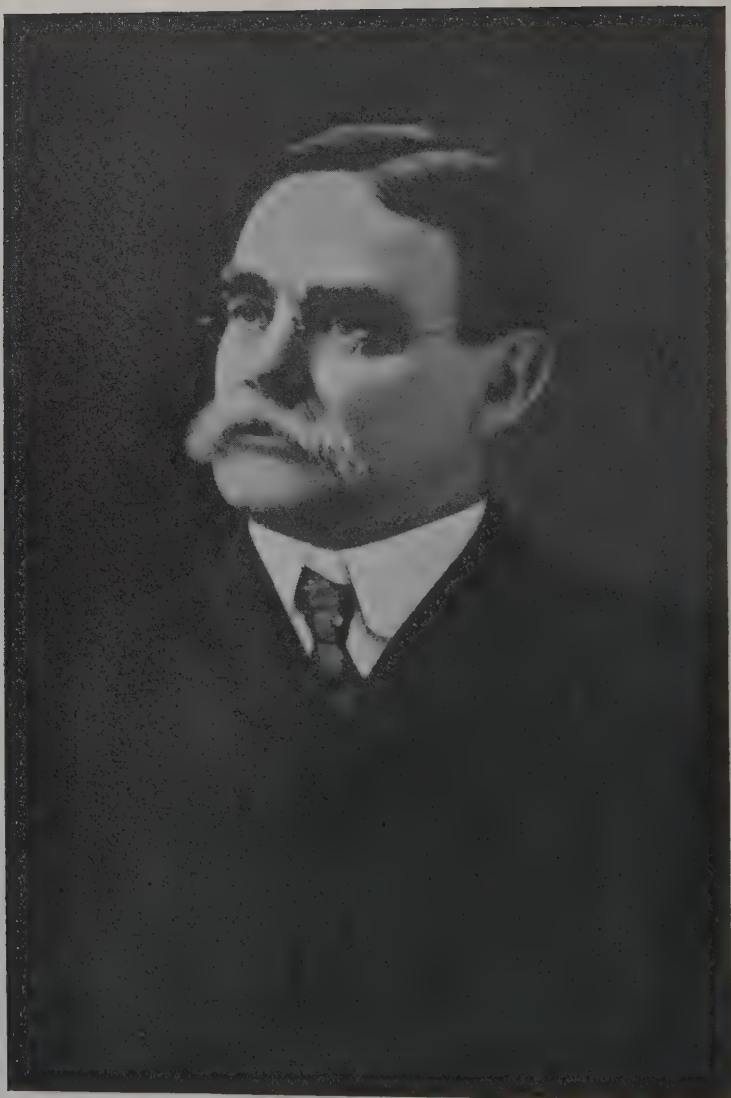
Miscellaneous.

A. M. S. T. Standards, 1921.

The following were contributed by Babcock & Wilcox Co.:

Boiler Code. Am. Soc. Mech. Engrs.
Heat Transfer.
Marine Steam.
Principles of Combustion.
Recent Developments in Oil Burning.
Steam, Its Generation and Use.
Unusual Efficiencies in an Oil Fuel Installation.

LIBRARY COMMITTEE.



SAMUEL EVERETT TINKHAM,
Secretary, Boston Society of Civil Engineers,
April 20, 1880 — December 20, 1882, and May 18, 1887 — April 21, 1921.
Died April 21, 1921.

BOSTON SOCIETY OF CIVIL ENGINEERS
FOUNDED 1848

PAPERS AND DISCUSSIONS

This Society is not responsible for any statement made or opinion expressed in its publications

IN MEMORY OF SAMUEL E. TINKHAM.

NOTE. — At the regular meeting of the Society, held September 21, 1921, which was devoted to the memory of Mr. Tinkham, the following papers commemorating the varied activities of his life were presented.

SAMUEL EVERETT TINKHAM.

By EDWARD W. HOWE, Past President, Boston Society Civil Engineers.*

SAMUEL EVERETT TINKHAM, for nearly thirty-seven years the Secretary of our Society, was born in Taunton, Mass., March 31, 1852, and died at his home in Roxbury, April 21, 1921.

He attended a meeting of the Board of Government on the afternoon preceding the regular April meeting of the Society on April 20, and during the interim between the two meetings, while at dinner at the City Club, he was suddenly overcome by an apoplectic shock. He was removed to his home in the Roxbury district, where he lingered in an unconscious condition until the evening of the following day, when he died.

Mr. Tinkham was a descendant in the eighth generation from Ephraim Tinkham, who while a minor came to Plymouth, Mass., in 1632, as an apprentice to Timothy Hatherly, one of the financial promoters of the infant colony, who, although not a passenger in the *Mayflower*, made two or more voyages to New England before finally settling in what is now Scituate, Mass.

In 1634 Hatherly transferred his apprentice to John Winslow.

* 26 Wayne Street, Grove Hall Station, Boston, Mass.

In 1642 young Tinkham, having probably become of age, for his services as an apprentice was given a grant of land, and before 1647 he married Mary, the daughter of Peter Browne, who came as a single man in the *Mayflower*, thus making all of the Tinkham family "*Mayflower* descendants." This, however, is not the only claim by which our friend and associate had that title, for we have been able to trace different lines of his ancestors to no less than six of the *Mayflower* Pilgrims. In addition to Peter Browne, he was descended from Richard Warren and Thomas Rogers, in the Tinkham line, and from Stephen Hopkins, George Soule and Francis Cooke, the latter in two lines, on the Ellis side, all of whom landed on Plymouth Rock from the *Mayflower* on that memorable day, December 21, 1620. There is reason to believe that, if time for the search had permitted, still others of that company would have been found among his progenitors.

Ephraim Tinkham appears to have been a man of some prominence in the communities where he lived. The Plymouth Colony records show that in 1656 he was one of the "Survayors of Highwaies," and mention is made several times in the records of his appointment to settle boundary disputes between estates. Perhaps this occupation may have had an influence through inheritance upon the choice of a profession by our fellow-member.

Ephraim Tinkham in 1666 is given, in records, the title of "sergeant." In 1669 he became one of the original proprietors or grantees of the town of Middleboro, Mass., and removed there and built a home; but in 1675, "King Philip's War" having broken out, the settlement was destroyed by the Indians and the inhabitants returned to Plymouth. In 1679 they returned to their grants. Ephraim's will was approved on June 5, 1685, and gives his children lands in Plymouth and Middleboro. His son Ebenezer lived in Middleboro, and the Tinkham line comes down from him through Jeremiah—Jeremiah—Elisha—Jeremiah to Samuel Miller Tinkham, the father of our late Secretary, all of them after Ebenezer, who was born in Plymouth, having been born in Middleboro.

Samuel Miller Tinkham was interested in early life in mechanical pursuits, and was the treasurer of the Taunton Foundry

and Machine Company. One of the productions of that company was the making of metal frames for pianos for the Chickering Company. Through acquaintances thus formed he was led to establish a music store in Taunton, which he carried on for many years.

Mr. Tinkham married, first, Miss Celia Ellis, of Plymouth, Mass., the daughter of Josiah Thompson and Sophia (Wright) Ellis and granddaughter of Sergeant Stephen Ellis, who was a soldier in the American Revolution. She was a descendant in the seventh generation from John Ellis, an early settler in Sandwich, Mass.

Mrs. Tinkham died when Everett was three years old and left four sons, one daughter having died in infancy. Not long after, the father married Miss Margaret E. Bright, who became as devoted to her husband's children as though they were her own. She had been a school teacher, and fully appreciated the value of a good education. We are told that she was accustomed to gather the boys around her in the evenings and study with them English history and read the stories of Charles Dickens.

It was through her persistence and help that Everett, after passing through the common schools and being instructed by a private tutor, was enabled to prepare himself for entering the Massachusetts Institute of Technology, becoming a member of the class of 1873. After graduating he was employed for a short time on the construction of a bridge at Cohoes, N. Y., and in the spring of 1874 he entered the office of the city engineer of Boston.

He was a member of the old First Church in Roxbury, of which John Eliot, the apostle to the Indians, was the first minister. For some years Mr. Tinkham was the chairman of the standing committee of the church. He was a member of the Sons of the American Revolution, and was greatly interested in Masonry.

Mr. Tinkham married, October 20, 1879, Miss Louisa W. Danforth, daughter of Charles J. and Sarah E. Danforth, of Roxbury. He is survived by her and by three children, namely, Charles S. Tinkham, resident engineer of the Massachusetts Highway Commission at Greenfield, Mass.; Frank B. Tinkham, in business in Boston, and Louise Danforth Tinkham, the wife of Leo Twombly, of East Orange, N. J.

Mr. Tinkham's engineering career, his work for the Society and in the Masonic body, will be described by others who will speak to you.

His funeral was conducted in the old Roxbury church, on Sunday afternoon, April 24, by the minister, Rev. Miles Hanson, and by Joseph Warren Commandery Knights Templars, and was very largely attended.

Associated as I was with Mr. Tinkham for nearly forty years in the City Engineer's Department of Boston, though not on the same work, and for sixteen years in the Board of Government of this Society, I cannot forbear, in closing, expressing my personal regard for him as a friend and my appreciation of his splendid character as a man. He was always a genial companion and ready with any assistance he could give. The City never had a more faithful and conscientious servant, nor our Society a more devoted, able and self-sacrificing officer.

S. E. TINKHAM'S CONNECTION WITH THE BOSTON SOCIETY OF CIVIL ENGINEERS AS ITS SECRETARY FOR THIRTY-SEVEN YEARS.

By DESMOND FITZGERALD, Past President, Boston Society Civil Engineers.*

I HAVE been asked to say a few words in regard to Mr. Tinkham's connection with this Society as its Secretary for many years. While it is an impossible task for any one to do justice to that connection, or to draw a picture which will adequately portray our feelings as we try to think of the Society without his guiding hand, it is one which we must attempt.

In 1873 a Boston Society of Civil Engineers was organized at the Massachusetts Institute of Technology, and of that society Mr. George S. Rice was the secretary. In 1874 the original society of 1848 was revived, and of that society Mr. Samuel Nott was secretary. He resigned and George S. Rice was elected to the office. After Mr. Rice's resignation, Mr. Tinkham, on April 21, 1880, was elected to the office. In 1882 a change came in Mr. Tinkham's business connections and he was

* Brookline, Mass.

obliged to resign. In accepting the resignation the following resolutions were adopted:

"*Resolved*, that the Boston Society of Civil Engineers fully recognizes its obligations to Mr. S. E. Tinkham, its late Secretary, for his efficient services in maintaining its general interests and providing entertainments at its monthly meetings, and for his efforts for the success of the Journal of the Association of Engineering Societies, and that it deeply regrets the resignation of the position he has so creditably and acceptably occupied.

"*Resolved*, that in evidence of the appreciation by the Society of Mr. Tinkham's services, these resolutions and the accompanying votes be entered upon the records of the Society and communicated to Mr. Tinkham, with an invitation to attend the approaching annual dinner of the Society, as a guest.

"*Voted*, that Mr. Tinkham's dues to the Society for the present and next financial years be remitted.

"*Voted*, that the Treasurer be authorized and directed to pay Mr. Tinkham the sum of fifty dollars as a further indication of the feeling expressed in the foregoing resolutions."

Between 1882 and 1887 the duties of Secretary devolved upon Mr. Horace L. Eaton. On his relinquishment of the office, Mr. Tinkham again became Secretary, which office he filled until his death, April 22, 1921, when that sudden call came to our friend to enter the higher life.

Thus for thirty-seven years S. E. Tinkham filled the office of Secretary. How well he filled it we all know.

The services of our friend in the early days were of quite a different nature from those which came later, when the Society had outgrown its early proportions.

Money, in those early days, was extremely scarce. Even in 1877, the Secretary was directed to ascertain the cost of printing a list of members, and report the expense. The chief problem then was, how to keep the society together, to coördinate the interests of the members and bring them into social as well as professional friendship. This was a duty for which Mr. Tinkham was well qualified. In all the wanderings of the Society, from the time when the library was kept in a single dry-goods box to the days of its present magnitude, Mr. Tinkham's cheerful and cordial interests were ever exerted for the advantages and enlargement of the Society. He had a friendly greeting for every

new member, and he never lost an opportunity to bring all the various branches of the profession into a closer union.

In the beginning, the Secretary was required by the constitution to keep an accurate record of all the transactions of the Society, notify all members of meetings, and issue all notices. The constitution was amended in 1879, and under its provisions the Secretary was required to have a list of members entitled to vote and forms of notices to be sent to members. He was also required to send an abstract of the proceedings of the previous meeting with the notices. Under the latest form, "the Secretary, under direction of the President and Board of Government, shall be the executive officer of the Society. He shall keep records of all meetings of the Society and of the Board of Government, shall receive all fees, dues and other moneys due the Society (except the income of the permanent fund), and transmit the same monthly to the Treasurer." He was also required to notify delinquents.

After all, it was not so much the numerous and delicate duties in every direction, "day in and day out" and "year in and year out," which fell to Mr. Tinkham's lot, as the spirit in which those duties were fulfilled. Measured by this standard, our faithful Secretary could not be found wanting. At one moment a new member was conducted into the field and in due time shown how he could aid the Society; at another, some older member, perhaps a little delinquent, required to be stimulated to fall into line and assume some share of the common load. Mr. Tinkham's nature seemed to possess an unlimited supply of good temper and discriminating knowledge amid all the varying conditions of a large and ever-increasing membership. He had the happy faculty of understanding the special resources of each member of the Society, and he knew best how to direct and control those resources for the benefit of all.

The Society, in its chequered career, has had many officers and members who have contributed to its usefulness and renown, but among them was one whose name leads all the rest, and the good which S. E. Tinkham accomplished for the Society will endure as long as the Society exists.

SAMUEL EVERETT TINKHAM: HIS SERVICES AS AN ENGINEER.

By FREDERIC H. FAY, Past President, Boston Society of Civil Engineers.*

SAMUEL EVERETT TINKHAM received his educational training as a civil engineer at the Massachusetts Institute of Technology, where he was graduated in 1873, at the age of twenty-one. Prior to his graduation, he had been employed during the summer vacation of 1872 in active field work as a rodman in the engineering department of the New York State Canals. After his graduation from Technology, he was appointed, in the summer of 1873, an assistant in the corps of Engineers, United States Army, and for more than a year was employed on harbor improvements at Edgartown, Mass.

In October, 1874, he was given a temporary appointment as transitman in the city engineer's office, Boston, on work which was expected to last about six weeks but which in reality lasted his whole lifetime, except for one brief interval. On his first day in the city engineer's office, while waiting for an assignment of work in the temporary absence of the city engineer, Mr. Wightman, he made the acquaintance of the chief clerk, who according to custom was copying, long-hand, a contract to accompany printed specifications. Mr. Tinkham eagerly accepted the invitation of the chief clerk to assist in this work; so it was that Mr. Tinkham's first work for the City was the laborious long-hand copying of a contract. To the younger members of the Society who take as a matter of course typewriting and stenography and modern office conveniences, this instance may give some idea of the length of Mr. Tinkham's service when they consider that its beginning antedated the typewriter and modern stenographic methods:

In those days, too, it was the practice to make an original contract drawing in India ink, on mounted white paper. Duplicates of contract drawings were obtained only by tracing them in India ink on tracing cloth, a process very laborious and expensive and extremely difficult to keep free from errors. Early in Mr. Tinkham's period of service for the City, Mr. Wightman, the city engineer, learned of the newly suggested blue-print

* Fay, Spofford & Thorndike, 15 Beacon Street, Boston, Mass.

process, thought it looked practicable and economical, and turned it over to Mr. Tinkham to work up. The latter bought and mixed the chemicals, coated the paper, took the prints, and throughout experimented with materials, apparatus and processes, getting more and more reliable results. He, therefore, was one of the early engineers to develop to a practicable working basis the modern process of reproduction by blue-printing.

Mr. Tinkham's service for the City of Boston was divided into two periods, the first, eight years in duration, from 1874 until 1882, and the second from 1884 until the day of his death. During the earlier period, he was engaged principally on city bridge work with the late John E. Cheney, who was then city bridge engineer. During this period several city bridges were built or reconstructed, notably, Dover Street, Meridian Street, Broadway and Chelsea bridges. In this period also the construction of the Boston Improved Sewerage System was in progress, and part of Mr. Tinkham's time was given to work in connection with the Boston Main Drainage System, particularly with the design and construction of the Calf Pasture Pumping Station.

By the fall of 1882 there had come a lull in the City's engineering work, such that Mr. Tinkham doubted whether his city position afforded him a future, and in November of that year he left the City's employ to become assistant engineer on the New York & New England Railroad, in charge of the design and erection of bridges for the double tracking of that road. His services for the New York & New England Railroad lasted until April, 1884, when his work on the road having been largely completed and prospects for engineering work for the City of Boston being brighter, he returned once more to the Boston city engineer's office, and for the following thirty-seven years, until the day he died, he was constantly in the City's service. Early in this second period of his work for the City, Mr. Tinkham was given the title of assistant engineer and principal draftsman of the Engineering Department. He became chief assistant to the bridge engineer, Mr. Cheney, and until the late '90's his work was largely that in charge of bridge designing. This period was one of considerable activity. Among the bridges built during this time were Allston, Beacon Street, Boylston Street, Brookline

Avenue and Cottage Farm bridges over the Boston & Albany Railroad; Byron Street Bridge, East Boston; Dover Street and L Street bridges in South Boston; the draw span of Neponset Bridge; and Harvard Bridge across the Charles River, which was built jointly by the cities of Boston and Cambridge under the direction of the Boston Engineering Department. At the time of its construction, Harvard Bridge was the largest bridge undertaking which had been carried out in this vicinity, the structure being some 2 200 ft. in length and having a width of 70 ft., except at the draw span, which is 50 ft. wide. Prior to its authorization, Mr. Cheney and Mr. Tinkham had jointly prepared preliminary estimates for a bridge of narrower width. When the authorization came, however, it was made on the basis of these estimates but prescribed the present larger width. This is illustrative of the difficulties which often confront the engineer, and it is greatly to the credit of the builders of this structure that, notwithstanding the inadequacy of the appropriation, the prescribed larger bridge was built within the sum allowed. By many, Harvard Bridge was looked upon as unnecessary. While it was under construction, the Boston Society of Civil Engineers, according to its custom, held an excursion to inspect the work, and one of the members of the Society inquired of Mr. Tinkham, who was in charge of the party, "Will anybody ever use this bridge? Will not Essex Street and West Boston Bridges take care of all the travel between Boston and Cambridge?" Considering that Harvard Bridge had become overtaxed long before Mr. Tinkham's death, this remark is indicative of lack of vision on the part of the member of the Society who made it.

In addition to his work on city bridges, Mr. Tinkham was engaged during the late '80's on further work of the Boston Improved Sewerage System and the Mystic Pumping Station, as well as upon studies for the elimination of grade crossings and other projected municipal improvements, in which work he was a forerunner of the modern city planner.

During the late '90's the engineering activities of the city were very largely increased. Several new bridges were undertaken, some of them, such as Charlestown and Cambridge bridges, being much larger structures than their predecessors. The

South Terminal Station, which was to unite the railroads on the southerly side of the city, was projected, involving much planning and construction by the City in a rearrangement of its streets and extensive constructions along the water front of Fort Point Channel. At the same time, Congress Street grade crossing on the South Boston flats, which had become a serious problem, was eliminated by the construction of Summer Street Extension across Fort Point Channel and over the South Boston flats, connecting with L Street Bridge at the Reserved Channel, South Boston. This was the largest grade-crossing elimination project which had been undertaken by the City, and Mr. Tinkham was largely responsible for the preliminary studies and for the final solution of the problem as embodied in the decree of the Grade Crossing Commission.

Up to this time, the bridge engineer, Mr. Cheney, had devoted his attention more largely to supervising construction in the field, while Mr. Tinkham, as his chief assistant, had devoted his time largely to work in the office. In the engineering activities of the late '90's, however, both Mr. Cheney and Mr. Tinkham found it necessary to devote practically all of their time to the supervision of construction in the field, Mr. Cheney assuming charge primarily of projects on the northerly side of the city, notably the Charlestown and Cambridge bridges over the Charles River, while Mr. Tinkham was given charge of the work in connection with the South Terminal Station, the Fort Point Channel improvements and the Summer Street Extension across Fort Point Channel and over the South Boston flats. Included in Mr. Tinkham's work was the building of Dorchester Avenue, in the location formerly occupied by the old wharves of Fort Point Channel, from Congress Street across Summer Street and alongside the entire South Terminal yard to Federal Street Bridge. This involved the construction of a sea wall half a mile in length, built under Mr. Tinkham's supervision, from his own carefully prepared designs and at remarkably low cost. Throughout the building of the South Terminal Station, Mr. Tinkham was engineer in direct charge of the City's work in connection with this project, and he was constantly in touch with representatives of the railroads concerned. He was instru-

mental in guiding this development and in the adoption of several construction features which he suggested. As an example of his foresight and his appreciation of traffic needs may be mentioned the "island" in Dewey Square, which was suggested and strongly insisted upon by him as necessary, not only to properly divide vehicular traffic into well-defined traffic streams but also to serve as a refuge bay for foot passengers crossing the square from the South Station to the junction of Federal and Summer streets. We know how traffic has increased in Dewey Square in the twenty-odd years since the South Terminal Station was built, and realize how much worse conditions would have been had not Mr. Tinkham had the wisdom to tenaciously adhere to his projected Dewey Square island.

For the last twenty-three years of his service for the City, Mr. Tinkham's work was largely that in charge of construction engineering, principally upon bridge construction work, but including also sea walls and retaining walls on land, difficult tide-water foundations, harbor shore protection, ferry improvements, wharves and other water-front structures. Some of the more notable projects with which he was connected, in addition to those already mentioned, are the building of the Northern Avenue and Sleeper Street improvement, from Atlantic Avenue in the City proper across Fort Point Channel and the South Boston flats, involving the construction of one of the most important of the City's tide-water bridges; grade-crossing elimination work, including the building of a number of new bridges over railroads; the rebuilding of Chelsea Bridge North over the Mystic River, including provision of the heaviest swing draw span in New England, spanning two navigation channels, each 125 ft. in width; the building of the new swing draw span of Broadway Bridge over Fort Point Channel; the rebuilding of Meridian Street and Chelsea Street bridges between East Boston and Chelsea, each with a swing draw span; the reconstruction of Malden Bridge between Charlestown and Everett in conjunction with the building of the Boston Elevated Railway Company's new Mystic River Bridge, and involving the construction of a large new bascule draw span; the rebuilding of Granite Avenue Bridge over the Neponset River, also with a bascule

draw span; the rebuilding or extensive reconstruction of many of the older tide-water bridges, such as Congress Street, L Street, Warren and Winthrop bridges; and the building or reconstruction of a long list of inland bridges — a list too long for present enumeration.

In 1911, the City Engineering Department, the Street Department and the Water Department of Boston were united into the present Public Works Department, and the new consolidated department was subdivided into three divisions, to one of which, the Bridge and Ferry Division, was assigned the building, operation and maintenance of the City's bridges and the East Boston Ferries, the elimination of grade crossings, and miscellaneous engineering work for the City which had formerly been handled by the city engineer's office. Mr. Tinkham was made construction engineer of the Bridge and Ferry Division, which position he held continuously until his death, and which was next in importance to that of the head of the division. Mr. Tinkham served as division engineer in charge of the Bridge and Ferry Division at various times in the absence of the division engineer, and was himself acting division engineer in 1914-1915, a position which brought him in contact with a variety of problems of administration in addition to those of an engineering nature.

Besides his work for the City, Mr. Tinkham was frequently retained by others in a consulting engineering capacity. For several years he was associated from time to time with Mr. Cheney in the latter's work as consulting bridge engineer for various railroads. Mr. Tinkham was also principal consultant upon many bridges built in different parts of New England, upon buildings and upon difficult foundation problems, as well as a consultant of the Metropolitan Water Board upon certain construction phases of the Metropolitan Water Works System.

Aside from his strictly professional work, Mr. Tinkham was of service to his profession in several allied directions in which his standing and experience as an engineer proved of distinct value.

His influence was largely felt in defining the underlying principles and establishing reasonable standards for the classi-

fication of engineers within the classified civil service of the state. The provisions of the Massachusetts Civil Service Law were extended in 1897 to include engineers in municipal employ, and in 1902 to include also engineers in the employ of the Commonwealth. Mr. Tinkham was appointed in 1897 one of the members of the first board of examiners for civil engineers in the classified service, a position which he held for more than fifteen years, until January, 1913. The other members of the original board of examiners were both members of this Society, — the late Henry Manley and Prof. Dwight Porter. As a member of this first board of examiners, Mr. Tinkham's influence was exerted in placing the engineering examinations upon a practicable and working basis.

Originally, civil service examinations were scholastic in their nature and the tendency was to estimate a man's fitness almost solely from his ability to pass a written test. Mr. Tinkham and the other members of his board saw from the beginning the futility of relying upon written examinations alone, and the importance of bringing in other means of ascertaining the fitness of the candidate to serve the city or the state. It was the duty of this first board, not only to determine the type and scope of examinations to be held and to decide the relative weights to be assigned to education, experience and demonstrated ability to do original constructive work as contrasted with mere ability to pass written examinations, but upon this board fell also the duty of framing the classifications by which the engineers then in the service, as well as those to be admitted later, would be graded.

It may be difficult for some of the younger members of this Society to realize the position of the engineer in governmental service prior to his inclusion within the classified service of the state, and to appreciate that no one had a greater influence than Mr. Tinkham in working out and establishing upon a rational basis the provisions of the civil service law as applied to the engineer in state and municipal employ.

Mr. Tinkham was of service to the profession at large through his active connection with many professional organizations. Aside from his membership and work in the Boston Society of Civil Engineers, which is treated at length by another

speaker, it may be noted that he became a member of the American Society of Civil Engineers in 1892 and was active in its affairs, serving twice as member and once as chairman of its nominating committee, and as a member of other committees, including a committee on the award of medals and prizes. For nearly thirty years he was a member of the New England Water Works Association, and for many years was a member also of the Massachusetts Highway Association.

A strong attachment for his *alma mater* was one of his outstanding characteristics, and all his life he was active in Technology alumni affairs. For many years he served as secretary of his class of '73, and it was this class which, in 1874, suggested the organization of the Technology Alumni Association. From 1882 to 1884, Mr. Tinkham was a member of the executive committee, and from 1884 to 1886 was vice-president of the Alumni Association. He represented his class on the Alumni Council from its organization in 1913 until his death. He was long an active member of the Association of Class Secretaries of the Institute. When the alumni were called upon, from time to time, for financial aid, his influence was actively exerted in the raising of funds for the support of the Institute.

A salient characteristic of Mr. Tinkham's life was his length of service, his sustained interest and his quiet, unassuming persistence in the many activities with which he was connected. His work at Boston City Hall — his chief vocation — lasted for a period of forty-five years. For forty-seven years he was a member of the Masonic fraternity, and another speaker testifies to his value and devotion to that body. He was long an attendant and for many years chairman of the standing committee of the First Church in Roxbury. His interest in Technology affairs was unflagging from the time of his graduation in 1873. His service on the board of examiners for engineers of the Massachusetts Civil Service Commission was long, devoted and untiring. His chief contribution to the engineering profession was his unparalleled service of more than thirty-six years as secretary of the Boston Society of Civil Engineers.

Mr. Tinkham was essentially a bridge engineer, but more than that he was a recognized authority on foundation problems

in general, and particularly upon constructions in tide-water under difficult and special conditions such as are encountered in Boston. His work of half a century covered a broad field, and he gained a fund of experience as well as a detailed knowledge of the City's engineering work, which made him invaluable not only in attacking new problems but in the care and maintenance of the City's engineering structures. At the time of his death, the highway bridges in Boston numbered 190, and nearly all of these were built or reconstructed — and some reconstructed a second time — during his connection with the City. The annual inspection of each of these structures, in which he shared at first and which he later directed, gave him an intimate acquaintance with the history, conditions and needs of each of them that no one else possessed.

The term "common-sense" engineer may be applied to Mr. Tinkham, a common-sense developed through his wide, varied and thorough experience. He learned just how work should be handled and carried out, and became a competent judge of good and proper work. He knew when a result was good enough for the purpose intended, and in consequence was not unreasonable in his decisions on contract work. He was broad enough to recognize and appreciate the contractor's difficulties and point of view, such that he was never over-exacting or finical in his relation with contractors, but at the same time he secured from the contractor faithful compliance with contract requirements and the degree of excellence of work needed in each particular case.

Mr. Tinkham worked harmoniously with, not against, the contractor. He was always ready to receive suggestions from the contractor, and was helpful in giving him the full benefit of his long construction experience, to the end that results might be produced by methods economical to the contractor and at the same time advantageous to the City. Many contractors, in bidding on construction work, take into account the personality of the engineer under whose charge the work is to be built. In the case of Mr. Tinkham, contractors knew that while under him a good quality of work was demanded, their interests would be secure against unreasonable decisions; in consequence, much

of the work done under Mr. Tinkham's charge was bid at low prices, of which the sea wall along Dorchester Avenue is an example. In this way Mr. Tinkham and his established reputation saved the City substantial sums over those which the City would have paid for work carried out under engineers of a different type.

Perhaps Mr. Tinkham's fundamental characteristics were unselfishness, companionability, a cheery good nature, and an absolute honesty, all of which were alike motive for and characteristic of everything he did; a sound common-sense which his long and intimate experience along many lines ripened into an insight of valuable depth and scope; and an unassuming, tireless activity always for, and usually with, others. Whatever he did, he did heartily. He concentrated his attention on performing each task thoroughly and well. His life was so filled with activity in different directions that there was scant time left for needed recreation, and his hours of idle leisure were rare indeed. His was truly a life of faithful and useful service.

A BROTHER MASON'S TRIBUTE.

BY HON. J. K. BERRY.*

WHEN you asked one from the Washington Lodge to speak of a brother Mason, and especially an engineer, it was natural for the thought to arise that Washington was as early and as renowned an engineer as any of which we find record in our history, and Washington was, when quite young, the Master of the Masonic Lodge at Alexandria. There, many of the portions of his regalia and many mementos of him in his Masonic life are now treasured in a very carefully prepared memorial building; and it was very natural that Everett Tinkham as we knew him should excel and be faithful both as a civil engineer or surveyor and as a Mason.

In 1873 the society of the Chi Phi established a chapter connected with Tech., and Mr. L. Jackson, afterwards a physician in Roxbury, invited and persuaded me to join their society; and after Everett passed away it occurred to me that probably he

* 14 Beacon Street, Boston, Mass.

joined at the same time I joined it. But I was in Harvard and didn't attend the meetings of the Chi Phi very much, so that I drifted away from that and I drifted away from him, and we didn't meet again as far as I know, until, I think it was in 1889, he joined some of our Roxbury bodies. He became a Mason in Taunton in 1874, when a little over twenty-two years old, and I have no record of him from that time until about 1888. Of course you know that in the meantime — 1879 — he was married, and you can well understand that in those early years he was busy getting started in his profession, and then with his family, and didn't have time probably to devote to Masonic meetings and duties, although there is no question that he more than made up later for any time then lost.

Perhaps most of you know that a man joining the Masons obtains the first three degrees and is then eligible for further degrees in the Royal Arch Chapter, and that was the first step taken by Brother Tinkham in 1888. Then he became a member of the Mt. Vernon Royal Arch Chapter in Roxbury, and in the same year he passed on to the next Masonic body that he could enter, a few degrees further on, — the Roxbury Council of the Royal and Select Masters; and then nearly a year later he joined by affiliation our Washington Lodge in Roxbury, which was of the same order — the same number of degrees — as the Charles H. Titus Lodge in Taunton, in which he was raised.

From his joining the Chapter and the Council in 1888 his activities began, and we find him holding offices in both of these bodies at the same time, which required the memorizing of ritual with considerable variations; and, as you know he never belonged to anything unless he performed all the duties connected with it, he was very punctual and very faithful in his subordinate offices, and a great support to the officers above him, and was gradually promoted and added greatly to the efficiency of the Royal Arch Chapter and the Council.

Then, too, he started along in line in our Master Masons' Lodge, or what we might call the lodge of the first three degrees, but it took in those days some seven or eight years, — beginning near the bottom, say as a deacon or a steward, before one could arrive at the position of Worshipful Master. He passed through

all those steps,— or chairs, as they are called, — and in 1905 and 1906, I think it was, he was the Worshipful Master of Washington Lodge, and he had the remarkable distinction of being installed in that lodge by Most Worshipful Brother Baalis Sandford, of Taunton, the Grand Master of the Grand Lodge of Massachusetts, who out of personal friendship for Tinkham came up and installed him. This was the second instance in the history of Washington Lodge in which a Master was installed by a Grand Master. The first instance was when Ebenezer Seaver in 1796 was installed by Paul Revere, who then was Grand Master of the Grand Lodge.

I think it was about that time, too, that Everett Tinkham was active in what is considered the highest body of the York Rite Masonry, — namely, the Knights Templars, — and he proceeded through the Joseph Warren Commandery, the order in Roxbury being Washington Lodge, the Mt. Vernon Chapter, the Roxbury Council and then into Joseph Warren Commandery. He went through and became its Eminent Commander, and was, if I remember rightly, a District Deputy Grand High Priest in the Chapter and Grand Principal Conductor of the Work in the Grand Council of Royal and Select Masters. Those are upper bodies. And I am quite sure that he was a member of the Grand Commandery of Massachusetts and Rhode Island.

While he was Senior Warden in our Washington Lodge — about 1904 or 1905 — the Roxbury Temple on Warren Street was constructed, and the corner-stone was laid during his term of office. Later he became one of the Board of Trustees for that building, and president of the Association which owns and controls that building. Also he was a member of the Committee of Masonic Charity of the Grand Lodge. He was also for us a trustee of Washington Lodge, and trustee for other bodies in regard to their funds, both for building and for other purposes. Of course I don't need to say why. You who have known him for forty years know that he was just the kind of a man who, if willing to accept any trust, would faithfully serve.

A quiet man, you might say, in some respects. You might not suppose there was quite so much to him as there really was, until you came to live with him and work with him. He never offended you with his superior knowledge, but you always found

he knew something you didn't know which fitted in to help. On committee work he always helped with suggestions, and in that way made things a success.

I didn't have an early intimate acquaintance with him because I have never been able to give that close attention to Masonry that he gave. I am a Past Master of Washington Lodge, but my close attention was in the years 1887 and 1888, before, in fact, he had been a Past Master. I had been a Master before he joined the Lodge. But last fall and spring, I had the good fortune to be associated with him upon the committee to prepare the one hundred and twenty-fifth memorial of the establishing of the Lodge, and I had the pleasure of working with him evenings at his apartment, and with Mrs. Tinkham, and we had good times together. We reviewed the history of the Lodge for the first one hundred years, to make a synopsis of it to go with that of the last twenty-five years, and in that way had the sort of association with Brother Tinkham and with Mrs. Tinkham which really gets you right down to know "folks," as they say, — and they were sterling people. We were proud to have had him with us. It may have seemed perhaps that he gave more of his life to Masonry than he should have, but most of you know that Masonry is founded on the three great lights, the Holy Bible, the square and the compass, and while perhaps in giving a little more time than most men do, his work was along those lines, and also his actions with you and with others squared with all the implements and conditions that he had in Masonry. The different bodies with which he was connected in Masonry have been proud and have felt it a privilege to record our memorials to his worth and to let the family know that we felt grateful that they loaned us their husband and father to help.

He passed out, an instance of a faithful man who didn't have any press agent and probably few people heard of him during his lifetime, but when all is said and done there are probably few men who lived as complete a life as he, and ninety-nine per cent have not lived and cannot be expected to live as complete a life. A faithful man who did his duty to the City, Church, and to the fellow-members of his profession, to the public and to those of his fraternities. He did his duty every day.

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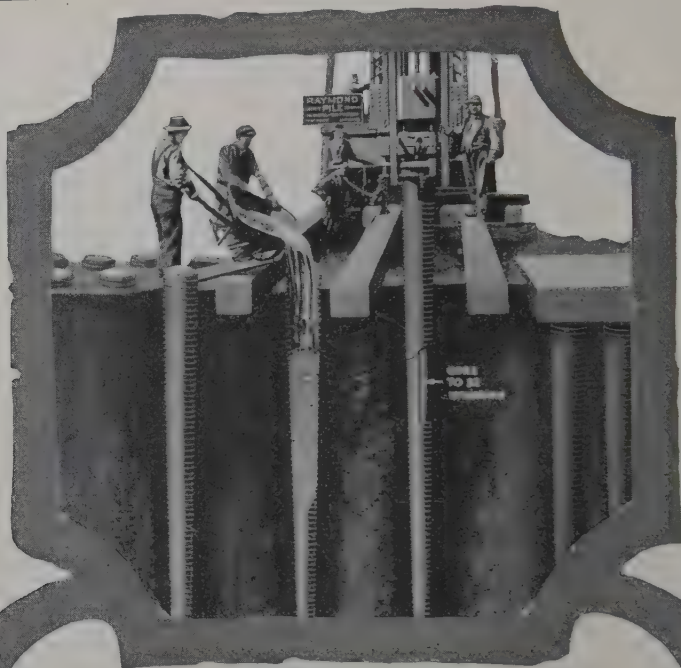
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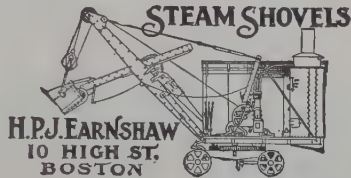
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